CLAIMS

Claims 1-9 (Cancelled).

10. (Currently Amended) ~~A method according to Claim 1 or 2,~~ A thin semiconductor film formation method for forming a polycrystalline or monocrystalline thin semiconductor film on a substrate, the method comprising:

a first step of forming a low-crystal-quality thin semiconductor film on the substrate;

a second step of performing lamp annealing on the low-crystal-quality thin semiconductor film so as to melt the low-crystal-quality thin semiconductor film or heat the low-crystal-quality thin semiconductor film while maintaining the low-crystal-quality thin semiconductor film in a non-melted state and then cool the low-crystal-quality thin semiconductor film thereby enhancing crystallization of the low-crystal-quality thin semiconductor film; and

~~further comprising the~~ a third step of forming a stepped recess with a predetermined shape and size in a particular area of the substrate where a device is to be formed,

wherein the first step includes forming a low-crystal-quality thin semiconductor film, which may or may not include one or more kinds of catalytic elements, on the substrate having the stepped recess, and the second step includes performing a focused-light annealing process such that graphoepitaxy growth occurs from lower edges of the stepped recess acting as growth seeds thereby converting the low-crystal-quality thin semiconductor film into the monocrystalline thin semiconductor film.

11. (Currently Amended) ~~A method according to Claim 1 or 2,~~ A thin semiconductor film formation method for forming a polycrystalline or monocrystalline thin semiconductor film on a substrate, the method comprising:

a first step of forming a low-crystal-quality thin semiconductor film on the substrate;

a second step of performing lamp annealing on the low-crystal-quality thin semiconductor film so as to melt the low-crystal-quality thin semiconductor film or heat the low-crystal-quality thin semiconductor film while maintaining the low-crystal-quality thin semiconductor film in a non-melted state and then cool the low-crystal-quality thin

semiconductor film thereby enhancing crystallization of the low-crystal-quality thin semiconductor film; and

~~further comprising the~~ a third step of forming a layer of a material such as sapphire well lattice-matched with the monocrystalline semiconductor in an area of the substrate where a device is to be formed, wherein the first step includes forming a low-crystal-quality thin semiconductor film, which may or may not include one or more kinds of catalytic elements, on the crystal layer, and the second step includes performing a focused-light annealing process such that heteroepitaxy growth occurs on the layer acting as a growth seed thereby converting the low-crystal-quality thin semiconductor film into the monocrystalline thin semiconductor film.

Claims 12-26 (Cancelled).

27. (Currently Amended) ~~A method according to Claim 26,~~ A thin semiconductor film formation method for forming a polycrystalline or monocrystalline thin semiconductor film on a substrate, the method comprising:

a first step of forming a low-crystal-quality thin semiconductor film on the substrate; and

a second step of performing lamp annealing on the low-crystal-quality thin semiconductor film so as to melt the low-crystal-quality thin semiconductor film or heat the low-crystal-quality thin semiconductor film while maintaining the low-crystal-quality thin semiconductor film in a non-melted state and then cool the low-crystal-quality thin semiconductor film thereby enhancing crystallization of the low-crystal-quality thin semiconductor film;

wherein the thin film for use in a silicon semiconductor device, a silicon semiconductor integrated circuit, a silicon-germanium semiconductor device, a silicon-germanium semiconductor integrated circuit, a compound semiconductor device, a compound semiconductor integrated circuit, a silicon carbide semiconductor device, a silicon carbide semiconductor integrated device, a polycrystalline diamond semiconductor device, a polycrystalline diamond semiconductor integrated circuit, a liquid crystal display, an organic or inorganic electroluminescence (EL) display, a field emission display (FED), a light emitting polymer display, a light emitting diode display, a CCD area/liner sensor, a CMOS sensor, or a solar cell is produced;

wherein when a device such as a semiconductor device, an electro-optical display, or a solid-state imaging device, which includes an internal circuit and a peripheral circuit, is produced, a channel region, a source region, and a drain region of a thin-film insulated-gate field effect transistor of at least one of the internal circuit and the peripheral circuit are formed using the polycrystalline or monocrystalline thin semiconductor film; and

wherein a cathode or an anode is disposed in a layer under an organic or inorganic electroluminescence layer of each color, wherein the cathode or the anode is connected to the drain or the source of the thin-film insulated-gate field effect transistor.

28. (Original) A method according to Claim 27, wherein active elements including the thin-film insulated-gate field effect transistor and a diode are covered with the cathode, or the surfaces of the organic or inorganic electroluminescence layers of respective colors and all areas between the organic or inorganic electroluminescence layers are covered with the cathode or the anode.

29. (Original) A method according to Claim 27, wherein a black mask layer is formed in areas between the organic or inorganic electroluminescence layers of respective colors.

30. (Currently Amended) ~~A method according to Claim 26,~~ A thin semiconductor film formation method for forming a polycrystalline or monocrystalline thin semiconductor film on a substrate, the method comprising:

a first step of forming a low-crystal-quality thin semiconductor film on the substrate; and

a second step of performing lamp annealing on the low-crystal-quality thin semiconductor film so as to melt the low-crystal-quality thin semiconductor film or heat the low-crystal-quality thin semiconductor film while maintaining the low-crystal-quality thin semiconductor film in a non-melted state and then cool the low-crystal-quality thin semiconductor film thereby enhancing crystallization of the low-crystal-quality thin semiconductor film;

wherein the thin film for use in a silicon semiconductor device, a silicon semiconductor integrated circuit, a silicon-germanium semiconductor device, a silicon-germanium semiconductor integrated circuit, a compound semiconductor device, a compound semiconductor integrated circuit, a silicon carbide semiconductor device, a silicon carbide semiconductor

integrated device, a polycrystalline diamond semiconductor device, a polycrystalline diamond semiconductor integrated circuit, a liquid crystal display, an organic or inorganic electroluminescence (EL) display, a field emission display (FED), a light emitting polymer display, a light emitting diode display, a CCD area/liner sensor, a CMOS sensor, or a solar cell is produced;

wherein when a device such as a semiconductor device, an electro-optical display, or a solid-state imaging device, which includes an internal circuit and a peripheral circuit, is produced, a channel region, a source region, and a drain region of a thin-film insulated-gate field effect transistor of at least one of the internal circuit and the peripheral circuit are formed using the polycrystalline or monocrystalline thin semiconductor film; and

wherein an emitter of a field emission display device is connected to a drain of the thin-film insulated-gate field effect transistor via the polycrystalline or monocrystalline thin semiconductor film, and wherein the emitter of the field emission display device is formed of an n-type polycrystalline semiconductor film or an n-type polycrystalline diamond film formed on the polycrystalline or monocrystalline thin semiconductor film.

31. (Original) A method according to Claim 30, wherein a shield metal film for providing a ground potential is formed, via an insulating film, on active elements including the thin-film insulated-gate field effect transistor and diode.

Claims 32-61 (Cancelled)

62. (New) A method of producing a semiconductor device including a polycrystalline or monocrystalline thin semiconductor film disposed on a substrate, the method comprising:

a first step of forming a low-crystal-quality thin semiconductor film on the substrate;

a second step of performing lamp annealing on the low-crystal-quality thin semiconductor film so as to melt the low-crystal-quality thin semiconductor film or heat the low-crystal-quality thin semiconductor film while maintaining the low-crystal-quality thin semiconductor film in a non-melted state and then cool the low-crystal-quality thin semiconductor film thereby enhancing crystallization of the low-crystal-quality thin semiconductor film; and

a third step of forming a stepped recess with a predetermined shape and size in a particular area of the substrate where a device is to be formed,

wherein the first step includes forming a low-crystal-quality thin semiconductor film, which may or may not include one or more kinds of catalytic elements, on the substrate having the stepped recess, and the second step includes performing a focused-light annealing process such that graphoepitaxy growth occurs from lower edges of the stepped recess acting as growth seeds thereby converting the low-crystal-quality thin semiconductor film into the monocrystalline thin semiconductor film.

63. (New) A method of producing a semiconductor device including a polycrystalline or monocrystalline thin semiconductor film disposed on a substrate, the method comprising:

a first step of forming a low-crystal-quality thin semiconductor film on the substrate;

a second step of performing lamp annealing on the low-crystal-quality thin semiconductor film so as to melt the low-crystal-quality thin semiconductor film or heat the low-crystal-quality thin semiconductor film while maintaining the low-crystal-quality thin semiconductor film in a non-melted state and then cool the low-crystal-quality thin semiconductor film thereby enhancing crystallization of the low-crystal-quality thin semiconductor film; and

a third step of forming a layer of a material such as sapphire well lattice-matched with the monocrystalline semiconductor in an area of the substrate where a device is to be formed, wherein the first step includes forming a low-crystal-quality thin semiconductor film, which may or may not include one or more kinds of catalytic elements, on the crystal layer, and the second step includes performing a focused-light annealing process such that heteroepitaxy growth occurs on the layer acting as a growth seed thereby converting the low-crystal-quality thin semiconductor film into the monocrystalline thin semiconductor film.

64. (New) A method of producing a semiconductor device including a polycrystalline or monocrystalline thin semiconductor film disposed on a substrate, the method comprising:

a first step of forming a low-crystal-quality thin semiconductor film on the substrate; and

a second step of performing lamp annealing on the low-crystal-quality thin semiconductor film so as to melt the low-crystal-quality thin semiconductor film or heat the low-crystal-quality thin semiconductor film while maintaining the low-crystal-quality thin semiconductor film in a non-melted state and then cool the low-crystal-quality thin semiconductor film thereby enhancing crystallization of the low-crystal-quality thin semiconductor film;

wherein the thin film for use in a silicon semiconductor device, a silicon semiconductor integrated circuit, a silicon-germanium semiconductor device, a silicon-germanium semiconductor integrated circuit, a compound semiconductor device, a compound semiconductor integrated circuit, a silicon carbide semiconductor device, a silicon carbide semiconductor integrated device, a polycrystalline diamond semiconductor device, a polycrystalline diamond semiconductor integrated circuit, a liquid crystal display, an organic or inorganic electroluminescence (EL) display, a field emission display (FED), a light emitting polymer display, a light emitting diode display, a CCD area/liner sensor, a CMOS sensor, or a solar cell is produced;

wherein when a device such as a semiconductor device, an electro-optical display, or a solid-state imaging device, which includes an internal circuit and a peripheral circuit, is produced, a channel region, a source region, and a drain region of a thin-film insulated-gate field effect transistor of at least one of the internal circuit and the peripheral circuit are formed using the polycrystalline or monocrystalline thin semiconductor film; and

wherein a cathode or an anode is disposed in a layer under an organic or inorganic electroluminescence layer of each color, wherein the cathode or the anode is connected to the drain or the source of the thin-film insulated-gate field effect transistor.

65. (New) A method according to Claim 64, wherein active elements including the thin-film insulated-gate field effect transistor and a diode are covered with the cathode, or the surfaces of the organic or inorganic electroluminescence layers of respective colors and all areas between the organic or inorganic electroluminescence layers are covered with the cathode or the anode.

66. (New) A method according to Claim 64, wherein a black mask layer is formed in areas between the organic or inorganic electroluminescence layers of respective colors.

67. (New) A method of producing a semiconductor device including a polycrystalline or monocrystalline thin semiconductor film disposed on a substrate, the method comprising:

a first step of forming a low-crystal-quality thin semiconductor film on the substrate; and

a second step of performing lamp annealing on the low-crystal-quality thin semiconductor film so as to melt the low-crystal-quality thin semiconductor film or heat the low-crystal-quality thin semiconductor film while maintaining the low-crystal-quality thin semiconductor film in a non-melted state and then cool the low-crystal-quality thin semiconductor film thereby enhancing crystallization of the low-crystal-quality thin semiconductor film;

wherein the thin film for use in a silicon semiconductor device, a silicon semiconductor integrated circuit, a silicon-germanium semiconductor device, a silicon-germanium semiconductor integrated circuit, a compound semiconductor device, a compound semiconductor integrated circuit, a silicon carbide semiconductor device, a silicon carbide semiconductor integrated device, a polycrystalline diamond semiconductor device, a polycrystalline diamond semiconductor integrated circuit, a liquid crystal display, an organic or inorganic electroluminescence (EL) display, a field emission display (FED), a light emitting polymer display, a light emitting diode display, a CCD area/liner sensor, a CMOS sensor, or a solar cell is produced;

wherein when a device such as a semiconductor device, an electro-optical display, or a solid-state imaging device, which includes an internal circuit and a peripheral circuit, is produced, a channel region, a source region, and a drain region of a thin-film insulated-gate field effect transistor of at least one of the internal circuit and the peripheral circuit are formed using the polycrystalline or monocrystalline thin semiconductor film; and

wherein an emitter of a field emission display device is connected to a drain of the thin-film insulated-gate field effect transistor via the polycrystalline or monocrystalline thin semiconductor film, and wherein the emitter of the field emission display device is formed of an n-type polycrystalline semiconductor film or an n-type polycrystalline diamond film formed on the polycrystalline or monocrystalline thin semiconductor film.

68. (New) A method according to Claim 67, wherein a shield metal film for providing a ground potential is formed, via an insulating film, on active elements including the thin-film insulated-gate field effect transistor and diode.